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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/586,047 | 07/14/2006 | Takeki Yoshimura | 0994-0249PUS1 | 2447 |

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| EXAMINER | |
|---|---|
| NGUYEN, HUY TRAM | |
| ART UNIT | PAPER NUMBER |
| 1797 | |

| NOTIFICATION DATE | DELIVERY MODE |
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| 11/12/2008 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/586,047 | YOSHIMURA, TAKEKI | |
| | Examiner | Art Unit | |
| | HUY-TRAM NGUYEN | 1797 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/14/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**2.** Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by **Yoshimura (JP 2003-096469).**

Regarding Claim 1, Yoshimura reference discloses an oil reconversion device for waste plastics characterized by the fact that in an oil reconversion device for waste plastics which performs thermal cracking by heating a waste plastic and converts the generated cracker gas into oil by cooling **(Abstract)**, and is equipped with a thermal cracking bath **(Drawing 1, numeral 5)** which has a bath main body placed inside a coil **(Drawing 1, numeral 6)**, induction-heats the bath main body by feeding a high-frequency current through the coil **(Abstract and Paragraph [0006])**, and thermally cracks at least a molten plastic obtained from the waste plastic to generate a cracker gas **(Paragraph [0006] – cracked gas G)**, an injection port through which the waste plastic is injected **(Drawings 1 and 3, numeral 28)**, a feeder which supplies the waste plastic injected through the injection port to the thermal cracking bath via a forced or direct feeding means without a bath **(Drawing 3, numeral 72)**, and an oil conversion processor which cools and converts the cracker gas generated by the thermal cracking

bath into oil **(Drawing 1, numeral 36 – capacitor unit and Paragraph [0022] – fuel oil).**

Regarding Claim 6, Yoshimura reference discloses the oil reconversion device for waste plastics described in claim 1 characterized by the fact that the thermal cracking bath is equipped with an agitating mechanism unit having an agitate-scraping unit which agitates a molten plastic contained in the bath main body and scrapes the molten plastic adhering to the inner wall of the bath main body **(Drawing 1, numeral 12 and Paragraph [0008]).**

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Tachibana (US Patent No. 5,738,025) in view of Yoshimura (JP 2003-096469)**.

Tachibana reference discloses an oil reconversion device for waste plastics characterized by the fact that in an oil reconversion device for waste plastics which performs thermal cracking by heating a waste plastic and converts the generated cracker gas into oil by cooling **(Abstract)**, and is equipped with a thermal cracking bath **(Figure 1, numeral 101)**, and thermally cracks at least a molten plastic obtained from the waste plastic to generate a cracker gas **(Figure 1 and Column 3, Line 39-Column 4, Line 4)**, an injection port through which the waste plastic is injected **(Figure 1)**, a feeder which supplies the waste plastic injected through the injection port to the thermal cracking bath via a forced or direct feeding means without a bath **(Figure 2, numeral 1 - extruder)**, and an oil conversion processor which cools and converts the cracker gas generated by the thermal cracking bath into oil **(Figure 1, numeral 109 - distillation column and Abstract).**

Tachibana also discloses a heating furnace for heating up the thermal cracking vessel **(Figure 1, numeral 106).** However, Tachibana does not disclose a coil induction-heating the bath main body by feeding a high-frequency current through the coil. Yoshimura discloses this heating means **(Drawing 1, numeral 6**, **Abstract and Paragraph [0006]).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the induction heating coil as taught by Yoshimura in place of the heating furnace of Tachibana since their use in the art and the selection of any of these known equivalents to the claimed heating means would be within the level of ordinary skill in the art.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Tachibana (US Patent No. 5,738,025) (Tachibana-1).**

Regarding Claim 2, Yoshimura reference discloses the oil reconversion device for waste plastics described in claim 1 except for an extruder having a heating cylinder and an extruding screw which melts and extrudes the waste plastic injected into the injection port. Tachibana reference discloses a similar apparatus for thermal cracking of waste plastics having an extruder for crushing and melting and extruding the waste plastic into the thermal cracking vessel **(Figure 2, numeral 2 and Column 3, Line 39-46)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the extruder of Tachibana in the device of Yoshimura since it was known in the art to feed plastics by use of an extruder.

7. Claims 3, 4, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Tachibana (JP 11-005984) (referred as Tachibana-2.**

Regarding Claim 3, Yoshimura reference discloses the oil reconversion device for waste plastics described in claim 1 except for a hopper to inject the waste plastic into the bath main body, has an open/close cap to open/close the injection port of this hopper and to open/close an injection path between the hopper and the bath main body, and is constructed so that an inert gas can be sent into the hopper. Tachibana-2 reference discloses the similar oil reconversion device for waste plastics comprising a hopper **(Figure 1, numeral 102)**, a nitrogen gas inlet **(Figure 1, numeral 103)** and

valves **(Figure 1, numerals 105 A, B and C).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the injecting means as taught by Tachibana-2 for transporting and melting the waste plastics before injecting the waste plastics into the bath main body/thermal cracking vessel since their use of either one of the structures in the relevant art and the selection of any of these known equivalents to each other would be within the level of ordinary skill in the art.

Regarding Claim 4, Yoshimura and Tachibana-2 references disclose the oil reconversion device for waste plastics described claim 3 characterized by the fact that the waste plastic injector has an injection pipe composing the injection path and is constructed by installing the open/close valve to this injection pipe and installing an open/close damper to the injection pipe in the bath main body side of the open/close valve **(Tachibana-2 - Figure 1, numerals 105A, B and C).**

Regarding Claim 5, Yoshimura and Tachibana-2 reference disclose the oil reconversion device for waste plastics described in claim 3 characterized by the fact that the thermal cracking bath also functions as the melting bath which melts the waste plastic **(Abstract).**

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Tsutsumi et al. (US 2004/0220337 A1)**

Regarding Claim 7, Tachibana reference discloses the oil reconversion device for waste plastics described in claim 6 except for the agitating mechanism unit being equipped with a heater which heats up the top surface of the molten plastic contained in the bath main body by being installed to the agitate-scraping unit. Tsutsumi et al.

reference discloses agitating element including heater **(Page 7, Paragraph [0106])**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an agitating element including heater as taught by Tsutsumi et al., since Tsutsumi et al. reference states at Page 7, Paragraph [0106] that such a modification would provide efficient and more uniform processing.

9. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Jiang (US 2002/0156332 A1).**

Regarding Claims 8 and 10, Yoshimura reference discloses the oil reconversion device for waste plastics described in claims 1 and 6 respectively characterized by being equipped with a residue processor which collects and heats residue plastic generated inside the bath main body **(Drawing 1, numeral 32 – residue treating part).** However, Yoshimura does not teach that the residue treating part being used to heat and supply a generated cracker gas to the oil conversion processor. Jiang reference discloses a system for converting waste plastics into hydrocarbons oil in a continuous processing step **(Figure 1)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further heat and thermally crack the residue to generate additional cracking gas and send the cracking gas to the oil conversion processor for producing the fuel oil **(Jiang - Page 1, Paragraph [0008]).**

10. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Sugiyama (JP 2002-309270).**

Regarding Claims 9 and 11, Yoshimura reference discloses the oil reconversion device for waste plastics described in claims 1 and 8 respectively except for an off-gas

processor having a burn processor which burns an off-gas generated in the processes of sequentially processing the waste plastic at a specified temperature or higher. Sugiyama reference discloses the burner for burning off the off gas generated in the process **(Paragraph [0017])**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermal cracking device of Yoshimura with the burner of Sugiyama since it was known in the art to burn off the off gas from the thermal cracking process of waste plastics to produce harmless gas which is environment friendly.

## ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUY-TRAM NGUYEN whose telephone number is (571)270-3167. The examiner can normally be reached on MON- THURS: 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HTN
11/6/08

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797